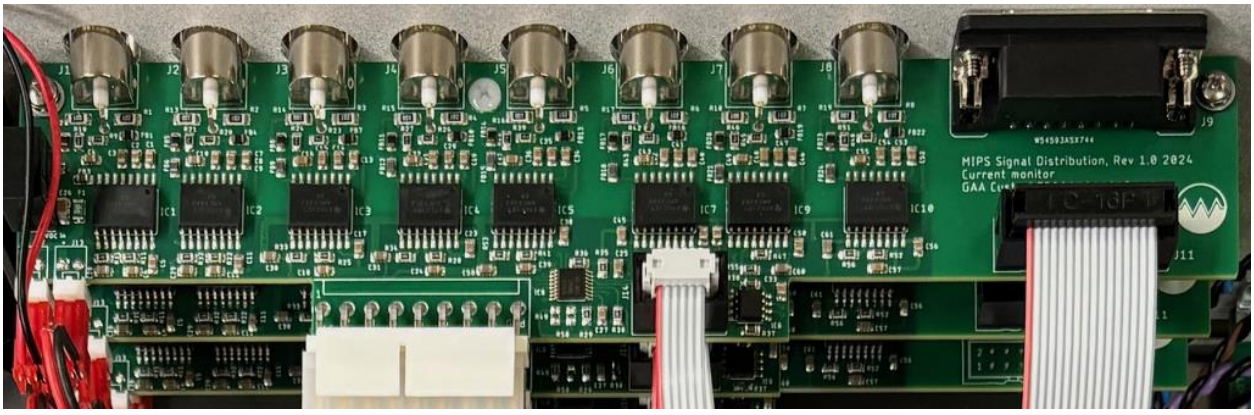
DCBias output current monitors
August 25, 2024



The DCBias output current monitor is a module that can be added to any DCbias supply. This module monitors the current on each of the 8 outputs and the control CPU reads this information and makes the data available through the host interface. The current data cannot be read using the MIPS front panel interface. The current monitor module replaces the BNC output module to add this capability and communicates with the MIPS controller using the auxiliary interface.

A total of four current modules can be installed in one MIPS system, each module has an 8 channel 12-bit ADC with a I2C interface. The I2C address is set via resistor placement options. The address needs to be set based on the DCBias module' board address. The table below defines the required addressing:

DCBias board address	Current module I2C address
0	0x48
1	0x49
2	0x4A
3	0X4B

The current monitoring range is +/- 7mA and the data is recorded using a 12-bit ADC.

The calibration and settings data for each current monitor module is saved on the MIPS controllers SD card. A separate configuration file is saved for each module. When the MIPS system initialized the current modules are detected and the configuration file loaded from the SD card. This allows the user to save the configuration desired and on powerup the saved settings are applied. If the configuration file cannot be found then default settings are loaded. The file names used to save this configuration data are listed below.

DCBias board address	Current module filename
0	CURPARM0
1	CURPARM1

2	CURPARM2
3	CURPARM3

The current monitor module allows defining a current limit, if this current limit is exceeded the MIPS system will disable the DC power supplies used to power the DCBias channel amplifiers. This current limit applies to all channels on a module, different modules can have different limits.

The following commands are automatically enabled when a current monitor module is detected.

CURLOAD,ch

This command will load the saved parameters for the current module defined by channel number (ch). Note that all the parameters are loaded for all the channels on the module defined by the channel number.

CURSAVE,ch

This command will save the parameters for the current module defined by channel number (ch). Note that all the parameters are saved for all the channels on the module defined by the channel number.

SCURTST,ch,TRUE|FALSE

This command will allow you to enable limit testing on the module defined channel number (ch). TRUE enables testing while FALSE disables testing. Note that this setting applies to all the channels on the module defined by the channel number.

GCURTST,ch

This command will return the limit testing status on the module defined channel number (ch). TRUE indicates testing is enabled while FALSE indicates testing is disabled. Note that this status applies to all the channels on the module defined by the channel number.

SCURLIM,ch,value

This command will allow you to set the current limit level on the module defined channel number (ch). The current limit is defined in mAmps, if the current's absolute value exceeds this limit then the DCBias power supplies will be disabled. Note that this setting applies to all the channels on the module defined by the channel number.

GCURLIM,ch

This command will return the current limit level on the module defined channel number (ch). The current limit is define in mAmps, if the current's absolute value exceeds this limit then the DCBias power supplies will be disabled. Note that this setting applies to all the channels on the module defined by the channel number.

GCURRENT,ch

This command will return the current reading, in mAmps, for the channel number (ch). The current limit is defined in mAmps.

CALDCBCUR,ch

This command is used to calibrate a channels (defined by ch) current sensor. This is used in the factory for initial system configuration and should not be used in the field.